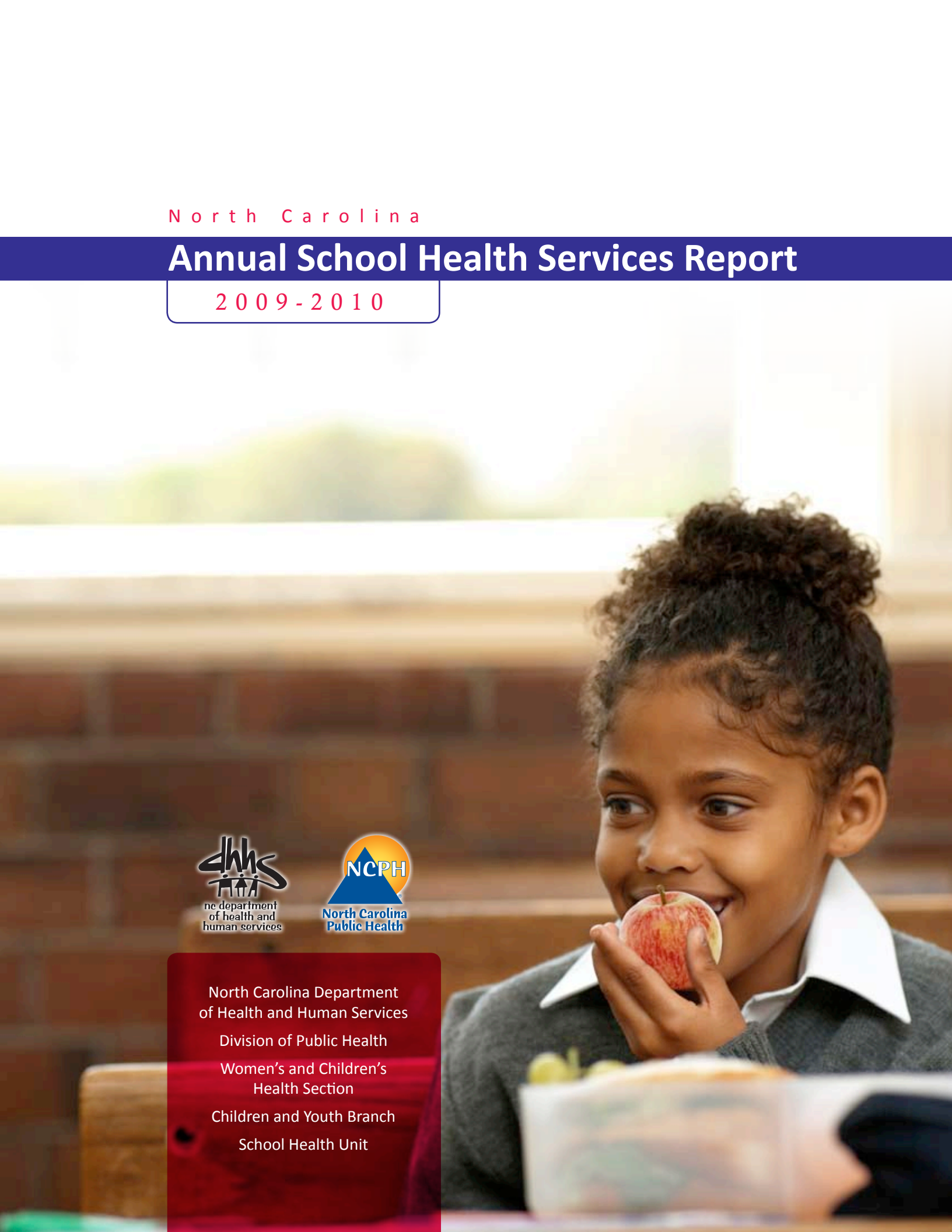
North Carolina

Annual School Health Services Report

2009-2010



North Carolina Department
of Health and Human Services

Division of Public Health

Women's and Children's
Health Section

Children and Youth Branch

School Health Unit

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Executive Summary

The National Center for Education Statistics identifies North Carolina as the 11th largest state public school system in the country.[1] More than 1.4 million (1,402,269) children were enrolled in North Carolina public schools during the 2009-2010 school year, a drop of about 8,000 students from the previous school year. North Carolina's leaders in both education and health agree that health and education are interdependent; therefore the identification of health-related barriers to learning is crucial to the academic success of every student. By the beginning of school year 2005-2006, North Carolina had instituted comprehensive school health services in every school district. This goal became a priority of the N.C. Public Health Task Force and subsequently, the state's Division of Public Health, in concert with the American Academy of Pediatrics, the Centers for Disease Control and Prevention (CDC), the American School Health Association and the National Association of School Nurses, established a goal that every public school student in North Carolina have access to a school nurse in a ratio not to exceed one nurse per 750 students. The state has made comprehensive school health services a priority through strategies such as the N.C. Healthy Schools Coordinated School Health program, the School Health Advisory Councils (SHACs), the N.C. School Health Leadership Assembly, and establishment of a School Health Cabinet at the highest levels of state government. Other strategies include the School Nurse Funding Initiative, the Child and Family Support Team initiative, and local funding directed toward school health services and personnel. Support for those efforts is provided through the Department of Public Instruction and the Division of Public Health by designated staff members including the state and regional school health nurse consultants, among others. During the 2009-2010 school year, despite the economic crisis, the number of full time school nurse positions remained unchanged from the year before, at 1,169.61 nurse positions. New nurse positions, 13.75 in total, were allocated by the General Assembly and were contracted in June of 2010. Including these positions, there are currently 1,183.36 acting school nurse positions. (See chart on page 9 for historical detail.)

School nurses in North Carolina are employed by a variety of agencies. Among the 115 LEAs (Local Education Agencies), more than two-thirds of the school health programs are administered by the school districts themselves. The remaining third of the programs are administered by local health departments, hospitals, or a combination of all three. Funding for school nurse positions is derived from a variety of sources including local and state funds, federal Title V block grant dollars, categorical funds, and public and private foundations.

The ratio of school nurses to students improved the past year, from 1:1,207 in 2008-2009 to 1:1,185 this past school year. The ratio improved in 79 percent of the LEAs, and only slightly worsened in 20 percent (one remained exactly the same). In August 1998, about 556 school nurses delivered services in 87 counties, and these nurses carried caseloads of about 2,450 students each. Over the past decade, the number of students in each nurse's caseload has been cut by more than half, enabling more students to access health services from a school nurse.

The roles and the responsibilities of a school nurse are differentiated from those of registered nurses working in other settings.

[1] http://nces.ed.gov/pubs2010/snf200708/xls/table_01.xls (Accessed 12-17-10)

Although principles of professional nursing remain consistent, the school nurse also must possess skills related to:

- A population-based focus on the entire school community, from students to staff to visitors to residents
- Expertise in pediatric and adolescent growth and development
- Knowledge and clinical expertise in the unique health issues of children and adolescents
- Ability to identify academic difficulties that may be related to a health problem
- Ability to problem solve in order to accommodate a student's disabilities and health needs into the challenges of school
- Knowledge of and ability to implement school nursing services in the federal and state programs designed for students with special needs (including both Individual Education Plans and Section 504 Disability Plans)
- Ability to put epidemiological principles into practice, including monitoring for clusters of symptoms that may indicate an emerging health threat for students and staff
- Knowledge of research findings and emerging issues, to educate the school community and implement evidence-based practices
- Skills in advocating for students and their parents to find common ground and reach agreement on accommodations to health problems
- Leadership and confidence while negotiating a student's personal crisis or assisting school administration in a school's crisis
- Ability to practice independently in a setting where he or she is usually the only health professional

Examples of school nurse activities include:

- Ensures compliance with school entry health requirements such as immunizations and physical exams
- Provides care and case management for children with chronic health problems
- Monitors security and safe administration of medications
- Assures the health and safety of the students and staff
- Takes a lead role in managing disasters and planning for emergencies
- Promotes student and staff wellness programs
- Assures school compliance with state and local regulations related to health and safety
- Identifies school health needs and advocates for necessary resources.

National certification in school nursing is the standard by which school nurses are judged to have the knowledge and skills necessary to provide these health services. During 2009-2010, the number of nationally certified school nurses, as a percentage of the total number of school nurses in North Carolina, increased by 3 percentage points to 53 percent. North Carolina has the highest number of nationally certified school nurses in the country.[2]

The skills and knowledge that the school nurse brings to the school health activities can be measured partially by outcomes related to the dual goals of improving a student's health status and academic work. During the 2009-2010 school year, the following outcomes were a direct result of school nurse-led management of students with specific disease processes:

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[1] National Board for Certification of School Nurses (NBCSN), 2010

Among students with allergies severe enough to affect their health and ability to learn:

- More than 900 stated that they had reduced the number of episodes of severe allergic reactions that required the use of their injectible emergency medication.
- Almost 2,000 stated that with the school nurse's assistance, they had increased their knowledge of their disease, its causes and treatments, and how to better manage the illness.

Among students with asthma severe enough to affect their health and ability to learn:

- Almost 4,000 said their improved health allowed them to increase their participation in physical education and/or after school physical activity.

Among students with diabetes severe enough to affect their health and ability to learn:

- More than 1,000 improved their skill in testing their own blood sugar and more than 500 calculated and correctly drew their own dose of insulin 100 percent of the time.

Among students with weight issues severe enough to affect their health and ability to learn:

- More than 500 were able to increase their participation in physical education, sports or after school activity and about the same number demonstrated a better understanding of their condition.

Additional data about these improved outcomes are described further under the heading "Student Health Outcomes" and specific examples are included throughout this report.

School nurses also provide general health education to staff and students; during the 2009-2010 school year, the nurses reported providing 27,825 programs and presentations:

- 48 LEAs (42%) presented asthma education programs for staff.
- 46 LEAs (40%) provided asthma education programs for students.
- 105 LEAs (91%) provided diabetes education programs for staff.

A critical function of school nurses is managing the care of students with chronic health conditions throughout the school day. During 2009-2010, the most common chronic health conditions of K-12 public school students in North Carolina, as reported by the nurses who care for them, were asthma (92,838), severe allergies (22,359), and diabetes (4,318). As part of care management, school nurses develop individual health care plans and train school staff members to give necessary medications and safely perform nursing procedures delegated by the nurse to school staff.

Health counseling is defined as any encounter with a student where instruction and advice for health promotion, health improvement and health maintenance were discussed. During the 2009-2010 school year, school nurses provided 178,116 health counseling sessions to individual students and staff. School nurses facilitated health screenings conducted in schools. Almost a half-million school children were screened for vision, and more than 25,465 students were seen by physicians or eye care professionals as a result of the referrals from school health professionals to obtain comprehensive eye exams.

Nurses received 113,206 physician orders for individual medications, including drugs for both regular, daily use by specific students as well as drugs ordered to be on hand should the student need them. The school nurse reviews the orders prior to administering the medications, training non-health care school staff to administer them, or, when specific conditions are met, assisting students to self-administer these medications. Review of the order by a Registered Nurse trained to identify the indications for use of a drug, its side effects and usual dosages and routes for it to be given, can reduce the incidence of medication errors. Routine audits by RNs of records of medications given to students means the risk of errors can be spotted and reduced quickly.

School nurses work with their local School Health Advisory Councils (SHAC) to develop and implement local programs designed to prevent illness and promote health. The SHACs are mandated by the North Carolina State Board of Education Healthy Active Children Policy (GCS-S-000). School nurses also assist with disaster/emergency planning for their communities. As the number and complexity of health needs of children in school continue to grow, so must the availability of school nurses until the recommended ratio of 1:750 is reached and, ideally, there is at least one school nurse in every school in North Carolina.

Methodology

This report is compiled from data submitted by school nurses based on their data collection and knowledge of health services provided in their schools. Data specialists and school nurse consultants in the N.C. Division of Public Health's Children and Youth Branch developed the survey instrument. Each of the 115 LEAs — 100 percent — participated in the data collection and submitted data onto the survey instrument electronically. Information is on health services in North Carolina public schools, not including public charter and state residential schools. Charter and private schools were invited to participate in data collection for this 2009-2010 school year, but, except for a required report from charter schools for data on students with diabetes, an insufficient number of reports were received from those schools to provide significant information. This report also does not include data from federal schools, such as those on military bases or in Native American reservations or in private or parochial schools.

The data were collected and sorted by Children and Youth Branch staff and analyzed by staff in the School Health Unit and Best Practices Unit.

Additional data for this report were collected from other sources, including:

- North Carolina Department of Public Instruction
- North Carolina Department of Health and Human Services, Division of Public Health:
  - Women's and Children's Health Section
- The National Society to Prevent Blindness North Carolina Affiliate, Inc.
- North Carolina Child and Family Support Teams Initiative

Additional data are available for further review by request.

Contact:

Jessica Gerdes, State School Nurse Consultant, Jessica.Gerdes@dhhs.nc.gov

Carol Tyson, School Health Unit Manager, Carol.Tyson@dhhs.nc.gov

[3] DATA SOURCES

N.C. Annual School Health Nursing Survey: Summary Report of School Nursing Services 2008-2009

N.C. Division of Public Health • Department of Health and Human Services

Public Schools of North Carolina • Department of Public Instruction

Introduction

The 2009-2010 report is the 14th Edition of the North Carolina Annual School Health Services Report. For each school year since 1996-1997, the North Carolina Division of Public Health has summarized major or significant findings from the collected school health data from each school district. This report summarizes data for school health services during school year 2009-2010 and provides information on trends.

The survey of the school health service programs also asks for comments regarding outcomes and successes during the past school year and goals for future years. This report includes a small selection of the accounts of successful outcomes; they are labeled "local outcomes" and offer examples of potential solutions to some vexing student health issues.

Local Outcome

A school nurse acted as the lead person in a team approach to case management of a PreK student that is entering kindergarten next year. This student is diagnosed with a heart condition in addition to other major health concerns. The school nurse worked in developing a plan of care and an emergency medical plan, and collaborating with others in the school system to ensure we are ready to receive this child in kindergarten with confidence. This included a multidisciplinary team with the nurse coordinating the care with the many doctors, specialists, OT, PT, speech, teachers, local EMS, and school administration. Without the input from the school nurse, this child would have been coming to kindergarten with no plan in place to ensure his care and school staff would not be comfortable in delivering services for this child. Because of case management by the nurse, this little boy will be ready to learn on day one!

Survey Population

Profile of Students Enrolled in North Carolina Public Schools

North Carolina's 1.4 million school children are as diverse as the state's population. They come from all socio-economic backgrounds and represent ethnic backgrounds from around the globe. The majority are male (51%) and white (54%). Other racial and ethnic populations in our schools are: Black or African American, 31%; Asian, 3%; Hispanic, 11%; American Indian, 1%. They attend our 2,422 public schools in 115 educational districts (100 districts organized by county and 15 by city). An additional 37,943 students attended the 96 North Carolina public charter schools in operation in 2009-2010.

Pre-kindergarten (Pre-K) Students

The health and physical condition of children when they enter school is one indicator of school readiness, according to the N.C. Office of School Readiness. North Carolina state government and the federal government provide funding for students in pre-school programs. In the public schools, those students enroll in More at Four Pre-Kindergarten programs, Title I Preschool, and Exceptional Children Preschool. The state's school nurses serve pre-k students to maximize their ability to be "healthy and ready to learn" at kindergarten entry. During the 2009-2010 school year, the school nurses reported serving 24,093 pre-k students compared to 21,533 the prior year, an increase of close to 12 percent. Many students in these programs are developmentally delayed, have disabilities, and/or have special health care needs. School nurses reported 3,782 chronic health

conditions among these pre-k students, with some having multiple diagnoses. Nearly one-third of the health conditions listed by school nurses as affecting their pre-k students included asthma (1,126). In addition or apart from asthma, students also had autism spectrum disorder (392); severe allergies (321); ADD or ADHD (284); seizure disorders (253); Down Syndrome and similar disorders (187); cerebral palsy (155); emotional or behavior disorders (136); and hearing loss (123) or severe vision loss (108).

The preschool student enrollment is in addition to the enrollment in kindergarten through 12th grade, and is not counted in the formula that results in the statewide school nurse-to-student ratio.

Exceptional Children

Intellectual, emotional and health impairments are among the disabilities that negatively impact a student's ability to learn. Some of those disabilities impact learning to a degree that makes the student eligible to receive Exceptional Children's (EC) services. Approximately 187,291, or 13 percent of public school children in North Carolina are enrolled in EC programs. Students in the EC program often require the assistance of school nurses, as many of them have additional conditions beyond their primary disability that require health care plans, emergency action plans, and other health accommodations. Most school nurses care for these students in addition to students in regular education. A small percentage of school nurses (fewer than 2%) are assigned to work exclusively with the EC program.

All students eligible for EC services must meet criteria for one primary disability, and may meet criteria for additional disability services. During the 2009-2010 school year, "Other Health Impairment" was the primary disability of 30,615 students, the 3rd most frequent among 14 classifications for primary disability. (The most frequent classification among students in EC programs in North Carolina was "Specific Learning Disability"; the next most frequent was "Speech or Language Impaired.") The state EC program classified another 6,741 students with these primary disabilities: "Traumatic Brain Injured," "Severe & Profoundly Handicapped," "Hearing Impaired," "Orthopedically Impaired," and "Multi-Handicapped." With each student who has a chronic health condition, the school nurse is involved in planning, delegating, providing oversight when others provide health care, and otherwise caring for the student.

School nurses often arrange for and provide general supervision of other nurses in the school setting. In some LEAs (18 during the 2009-2010 school year), private-duty nurses provided care to students who were medically fragile and needed care on a one-on-one basis during the entire school day.

Profile of Nurses Employed in N.C. Public Schools

The school nurse is a registered nurse (RN) in a specialized professional practice that requires different educational preparation, experiences, skills and knowledge than that of nurses working in acute care or even other community settings. The American Academy of Pediatrics has affirmed that the school nurse has a crucial role in the seamless provision of comprehensive health services to children and youth.[4] The Academy's position statement of May 2008 states that increasing numbers of students enter schools with chronic health conditions that require management during the school day. School nurses provide

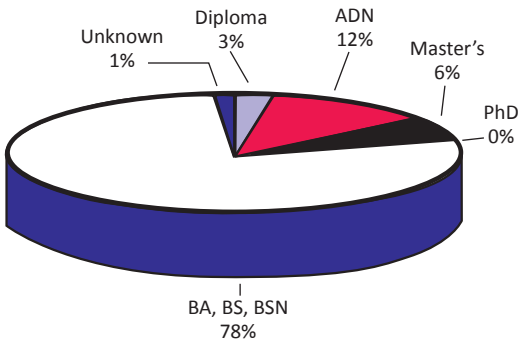
[4] American Academy of Pediatrics: Policy Statement "Role of the School Nurse in Providing School Health Services" May 2008

preventive services, early identification of problems, interventions, and referrals that serve to improve health and educational outcomes. In North Carolina, the school nurse often functions as a member and occasionally as the coordinator of the local School Health Advisory Council. School nurses are involved in each of the eight components of a Coordinated School Health Program: health services, health education, physical education, nutrition services, health promotion for staff, counseling and psychological services, healthy school environment, and family/community involvement.

Local Outcome

We collaborated with Brody School of Medicine to provide an opportunity for all first year pediatric resident physicians to spend a day in the schools with a school nurse as part of their "Community Pediatric Medicine" rotation. The emphasis is on the pediatrician's role in the educational setting.

Educational Preparation



B.S.N.—Bachelor of Science in Nursing
Diploma—Hospital Based Nursing Education
A.D.N.—Associate Degree in Nursing

Educational Preparation of School Nurses

School nurses are registered nurses (RN) licensed by the North Carolina Board of Nursing. Educational preparation for entry into registered nursing is through one of three routes: a bachelor's degree from a four-year college or university; an associate degree in nursing from a community college or technical college, or a diploma conferred by a hospital. Driven in part by recommendations of national leaders in school health,[5] and in part by recommendations of state leaders and requirements of funding partners, the level of educational preparation of school nurses in North Carolina has increased steadily over the years. It increased again this year, with 84 percent of school nurses holding bachelor's degrees or higher during the 2009-2010 school year.

In addition to the basic preparation of registered nurses through formal education, RNs are expected to learn additional aspects of their specialties through on-the-job and continuing education. Registered nurses who are new to the specialty of school nursing learn their new roles and responsibilities through continuing education provided by the N.C. Division of Public Health and its co-sponsors, as well as during orientation offered by their school district, health department or hospital employers. The N.C. Board of Nursing requires evidence of continuing education for the state's registered nurses to renew licensure. School nurses in North Carolina attend continuing education activities offered through the nine regional Area Health Education Centers (AHECs), through a number of colleges of nursing, and through the Public Health Nursing Professional Development

[5] American Academy of Pediatrics: Policy Statement "Qualifications and Utilization of Nursing Personnel Delivering Health Services in Schools (RE7089)."

(PHNPD) provider of continuing education, delivered through a network of state and regional nurse consultants within the N.C. Division of Public Health.

Local Outcome

Our most important achievement is always the health of the students. Our nursing staff worked diligently all year to serve the students' health needs. Whether it was training staff or working directly with students, parents or health care providers, students received the care they needed.

National School Nurse Certification

Since 1998, the N.C. Department of Public Instruction has required that all school nurses hired by Local Education Agencies hold national school nurse certification. Non-certified nurses hired after this date may be employed but must achieve certification within three years of date of employment. School nurses not employed by LEAs are encouraged, and in some cases required, through their funding partners, to obtain certification as a mark of achieving this increasingly recognized standard. It is recommended that school nurses experience a full year in the practice before attempting to take the certification examination. Currently, more than half (53%) of North Carolina nurses working in public schools hold national school nurse certification from one of the two national certifying bodies: the American Nurses Credentialing Center (ANCC) or the National Board for Certification of School Nurses (NBCSN).

As a rule, school nurses in North Carolina have a number of years of practice as a registered nurse in acute care and community health settings before entering the school nurse specialty. During the 2009-2010 school year, 59 percent had more than three years' experience in school nursing in addition to prior years of professional practice.

Ratio of School Nurse to Students

The national recommendation for the school nurse-to-students ratio is 1:750 for students in the general population; 1:225 in the student populations requiring daily professional school nursing services or interventions; 1:125 in student populations with severe and profound disabilities and complex health care needs; and 1:1 for some individual students who require daily and continuous professional nursing services.[6] The aforementioned ratios would allow all students to have their health needs safely met while in the school setting, including appropriate preventive, health promotion, early identification and intervention services.

For this report, school nurse-to-students ratios were based on full-time equivalencies (FTEs of positions budgeted for school nurses[7]) to work in local education agencies (LEAs). Registered nurses working solely as administrators, without caseloads of students, were not counted in the FTE or ratio. Using that definition, there were 1,169.6 FTE budgeted school nurse positions active during the 2009-2010 school year, essentially unchanged from 2008-2009. Late during the 2009-2010 school year, an additional 13.75 school nurse positions were allocated through the state School Nurse Funding Initiative. The position funding took effect June 1, 2010,

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[6] National Association of School Nurses, Position Statement, Caseload Assignments, Adopted 1972, Rev. 2006; See also CDC Healthy People 2010

[6] FTE = Full Time Equivalency for school nurse positions (all full and part time hours divided by full time hours as defined by local school district)

and are included in the staffing data for this year's report (see following chart).

The school nurse-to-students ratio varies widely from LEA to LEA. At the end of the 2009-2010 school year, the statewide average ratio of school nurse to students was 1:1,185. Most LEAs showed improvement, and 41 LEAs met the target ratio of 1:750, two more than the previous year. The ratios ranged from 1:272 in Pamlico County to 1:3,141 in Davidson County Schools. For a breakdown of school nurse to students ratio by LEA, see Appendix C.

Local Outcome

We know we have success when we take care of a student's health problem instead of sending them home. This year, we kept track of that data, and we found that more than 85 percent of our students were able to remain in school after seeing the nurse. We aim to keep the "dismissed" rate to below 15 percent.

Student Population, School Nurse Staffing, and Nurse-to-Students Ratios

Number of:	School Year 2004-2005	School Year 2005-2006	School Year 2006-2007	School Year 2007-2008	School Year 2008-2009
LEAs	115	115	115	115	115
Schools*	2,227	2,338	2,354	2,399	2,422
Students**	1,363,695	1,386,363	1,404,957	1,410,497	1,402,269
School Nurse FTEs	867.86	1,034.00	1,146.51	1,169.04	1,183.36
Average N.C. School Nurse/ Student Ratio	1:1,571	1:1,340	1:1,225	1:1,207	1:1,185
School Nurse Personnel (Individuals)	932	1,083	1,266	1,231	1,233

* Public Schools of North Carolina, "Facts and Figures 2009-2010", February 2010

** NC DPI. Final ADM. www.dpi.state.nc.us/fbs/accounting/data Retrieved 8/4/2010

Employers of School Nurses

School nurses are primarily employed by their local education agencies (LEA). The administrative responsibility for 71 percent of school health services programs in North Carolina lies within the LEA. The chart on the previous page shows the yearly increase in North Carolina public school nurses in the past five years. A relatively small number of school nurses are employed part-time.

Administrative Responsibility for School Nursing Services

The map given in Appendix D illustrates the agency or agencies responsible for the delivery of school health services in each LEA. In most counties, either the school district (LEA) or health department hires, supervises, and manages the school health services program. The map does not reflect funding sources, which are varied (see next section).

Administrative Responsibility for School Nursing Services

Administrative agent	Percent of school districts (LEAs)
Local Education Agency (LEA)	71%
Health Department	13%
Hospital/ Health Alliance	4%
Funding from a combination of sources	12%

Funding for School Nurses

Although the local school board, or LEA, is the primary employer of North Carolina school nurses, the money for school nurses comes from a wide variety of sources. Rarely is the entire school health services program funded through a sole source. Funding sources include: local tax revenue, through property taxes allocated to the local school and local health department; N.C. General Assembly appropriations, such as through distributions from the state Department of Public Instruction and state Division of Public Health; federal reimbursement, including approved Medicaid expense reimbursements or federal Title V grants and categorical funds; hospitals; health care organizations and private foundations.

In recognition of the enormous health needs of school-age children and the relationship between health and academic success, the General Assembly appropriated funds through the School Nurse Funding Initiative (SNFI), beginning in the 2004-05 school year and additionally each “long” session thereafter, in 2007 and 2009. By the end of the 2009-2010 school year, the state had allocated funds to support 225.75 full time school nurse positions. These funds are distributed by the N.C. Division of Public Health to local health departments, local education agencies, and hospitals employing school nurses.

In 2005, the Child and Family Support Teams Initiative was initially authorized and funded by the N.C. General Assembly. It was

reauthorized in the 2007 and 2009 state budgets. The initiative provides recurring state funds to team 80 school nurses with an equal number of school social workers at schools in 21 school districts across the state. The purpose of the initiative is to provide school-based professionals to screen, identify and intervene for children who are potentially at risk of academic failure or out-of-home placement due to physical, social, legal, emotional or developmental factors.

Through state and local efforts to increase funding for school nurses, the number of LEAs meeting the recommended ratio of 1:750 has nearly quadrupled in the five years between the 2003-2004 and 2009-2010 school years

The labor demand for all nurses, including qualified school nurses, has grown rapidly in the past decade. At the same time, the complexity of student health needs has grown. School health program supervisors, 40 percent of whom are registered nurses themselves, are highly successful in attracting and retaining school nurses. In the 2009-2010 school year, they succeeded in filling 99 percent of all school nurse positions. Only 12 positions statewide were vacant for the majority of the school year.

School Health Services

School nurses provide basic and comprehensive school health interventions to all children in the population served, including children with special health care needs resulting from acute and chronic complex medical conditions.

Chronic Health Conditions

All children are eligible to attend public school and receive a free and appropriate education. A number of these children, nearly one of every five students attending school, have chronic health conditions. Since these conditions can affect attendance, school performance, and the students' physical and emotional level of well-being, school nurses work closely with students, their families, health care providers and school staff to reduce the negative impact of illness on learning. Nurses serve as case managers, evaluate activities of daily living, and develop appropriate modifications for the learning environment. The percentage of public school students with chronic health conditions has risen almost every year for the past decade, approaching 19 percent this school year. The number and percent of students with reported chronic health conditions are illustrated in the table below.

Asthma, a major chronic illness among school children, is the leading cause of school absenteeism nationwide, according to national experts on lung disease. The number of North Carolina students known to school nurses to have asthma during the 2009-2010 school year, was 92,838.

Severe allergies are those for which a student carries or is provided medication at school, such as peanut allergies or insect sting allergies. During the 2009-2010 school year, 22,359 were listed as having severe allergies, 3,920 more than during school year 2008-2009.

In North Carolina public schools, students with asthma and allergies may carry and administer their own asthma and allergy medications with appropriate physician and parental authorizations and after demonstrating the ability to safely administer their own medication for those allergies and asthmatic conditions. Students who are not able to demonstrate to the school nurse an ability and understanding of how and when to use the medication are not permitted to self-carry or self-administer those medications without supervision. Students who are able to self-medicate for asthma or severe allergies may still seek the help of a school nurse to assist them in case of emergency or inability to self-administer the medications.

Local Outcome

I am working with a child who had severe asthma symptoms, including hospitalization at the beginning of the year. She had 14 asthma related visits to the student health office before Christmas. The parent initially did not seem to think that her asthma was serious and did not want to leave an inhaler for her at school. She later agreed to our case management services and brought a rescue inhaler to school, along with physician authorization. The child now understands her asthma diagnosis and treatment and has had just four asthma related visits to the student health office since Christmas. Her mother is now supportive of our efforts.

Medication	Number
Asthma inhalers known for self-carry	19247
Diabetes medication known for self-carry	2604
Epinephrine auto injectors known for self-carry	3572

There was a 6 percent decrease in the number of students enrolled who were reported with diabetes: 4,318. In response to the increasingly complex needs and high technology related to school-day management of diabetes, school nurses train staff to care for students with diabetes. The staff training includes training of diabetic care managers, a school function established by the General Assembly in 2003, and development of diabetic care plans (individual health plans) for students with diabetes who need care during the school day. Students with diabetes are encouraged to self-manage their symptoms, which will most likely last their lifetime. School staff members assist students as needed.

For a more extensive list of the types of chronic health conditions that were managed at school, see Appendix A, pages 33-34.

Number and Percent of Identified Chronic Health Conditions

School Year	Number and Percent
99-00	114,765 (9%)
00-01	131,589 (11%)
01-02	129,329 (10%)
02-03	121,877 (10%)
03-04	161,559 (12%)
04-05	197,052 (15%)
05-06	209,718 (15%)
06-07	227,940 (17%)
07-08	237,245 (17%)
08-09	240,528 (17%)
09-10	265,479 (19%)

Diabetes:

- 4,318 students reported with diabetes 2009-2010
- 3,548 monitor blood glucose at school (with physician's order for procedure)
- 2,244 receive insulin injections at school
- 1,700 manage insulin pumps
- 2,604 are known to self-carry their medication

In 2009, the General Assembly enacted additional requirements to the "Care of Students with Diabetes Act" (also known as SB 738, additional requirements to SB 911). At the request of the State Board of Education, the School Health Unit included the following four questions in its annual survey designed to assess compliance with the Act by all public and charter schools in North Carolina:

1. Does your LEA offer annual generalized diabetes training to school staff, system-wide?
2. How many students with diabetes were enrolled in your LEA / charter school this past school year?

3. Did your LEA / charter school have at least two persons who were intensively trained on diabetes care, in any school in which one or more students with diabetes were enrolled?
4. How many students with diabetes had an Individual Health Plan (IHP) completed by a school nurse in the past school year?

All public, non-charter school districts completed these questions and reported:

Number of students with diabetes[8]	4,297 (0.3% of enrolled students) No LEA reported having no students with diabetes enrolled this school year.
Offered annual generalized training about diabetes to school staff, system-wide, as required by the statute	105 (91%)
Students with diabetes who had an Individual Health Plan (IHP) completed by a school nurse (parent or student over age 18 may refuse an IHP)	3,675 (85.5% of students with diabetes)
In each school where one or more students with diabetes were enrolled, there were two or more persons intensively trained on diabetes care	111 (96.5%)

Although this publication of the School Health Services report does not otherwise contain information from charter schools, this section includes information submitted by charter schools to these questions, as communicated to the School Health Unit at the Division of Public Health during the summer of 2010. About half of the public, charter school districts completed these questions and reported:

Number of students with diabetes	73 (percentage not available)
Offered annual generalized training about diabetes to school staff, system-wide, as required by the statute	21 (42% of those reporting)
Students with diabetes who had an Individual Health Plan (IHP) completed by a school nurse (parent or student over age 18 may refuse an IHP)	47 (64% of those reporting)
In each school where one or more students with diabetes were enrolled, there were two or more persons intensively trained on diabetes care	26 (89% of those reporting)

Local Outcome

I've been working with a diabetic child for a few years and his blood glucose levels have never been stable. I worked with him more intensively this year, and as a result, he now seems to be improving in his ability to recognize when his blood sugar levels are low, because he had eight episodes with low glucose readings prior to Christmas and just four episodes since Christmas. He is improving in his ability to manage his own disease.

[8] 4,297 is the figure reported by July 2010 for the report to the State Board of Education in August 2010. One LEA subsequently revised figures for 09-10, resulting in a revised total of 4,318 students with diabetes in this Annual Report of School Health Services 2009-2010.

Health Counseling

Students contact the school nurse for answers to questions ranging from normal growth and development to serious emotional and mental health concerns requiring referrals to mental health professionals. Health counseling is defined as any encounter with a student where direct service, instruction and advice for health promotion, health improvement and health maintenance were discussed. During the 2009-2010 school year, the numbers of such encounters reported by school nurses totaled 177,298, more than double the previous year's activities in this broad category. That increase is a result of adding categories to the reporting form, as recommended by school nurses based on the types of individual health counseling students receive. The single most frequent topic for school nurse counseling was personal body issues, including hygiene, puberty, and sexual and reproductive health. The school nurse is frequently engaged in conversations with students about menstruation, hygiene, body odor, acne and other issues related to puberty. Students also confide in a school nurse about instances of violence or bullying, and over possible neglect or abuse within their family or their concerns over a friend or neighbor. School nurses must report suspicions of child abuse/neglect whether observed or given credible suspicion by another person. Students also sought the advice of school nurses about substance abuse and tobacco use. Individual discussions around depression/suicide occurred in all grade levels.

Individual Health Counseling Sessions

Topic[+]	Elementary	Middle	High	Total
ADD/ADHD	6090	3599	1577	11266
Asthma	21691	6219	4113	32023
Child Abuse/Neglect	1817	697	594	3108
Depression/Suicide / Other	680	1413	3086	5179
Diabetes (both Type I &Type II)	13959	10804	8066	32829
Grief/Loss	1197	863	1291	3351
Hygiene	12421	6831	4735	23987
Mental Health Issues	3043	4279	4629	11951
Pregnancy	40	1053	7478	8571
Puberty; Reproductive Health	5148	4798	8799	18745
Seizure Disorders	2430	851	1185	4466
Severe Allergies	6452	1791	1668	9911
Sickle Cell	408	111	246	765
Substance Abuse	166	710	2280	3156
Tobacco Use	141	758	2351	3250
Violence/Bullying	1458	1813	1469	4740
Totals	77141	46590	53567	177298

[+] Rows not highlighted do not include Charlotte-Mecklenburg Schools due to a difference in reporting categories.

Local Outcome

The school nurse program coordinated the ARRA school flu program that vaccinated 7,299 students against seasonal flu (3,664 nasal mists and 3,635 injected). This represented 53 percent of the entire elementary school population. In addition, the schools and health department collaborated to monitor daily absenteeism across all 50 schools in the county. This required NC WISE data managers to send daily absentee data to the health department where the data was collated and analyzed. For absences that exceeded 10 percent, a flag alerted staff to monitor the conditions of that school more closely. This allowed prompt action to monitor schools for increased flu activity and has aided our surveillance of concerns with other communicable diseases this spring.

Health Teaching

School nurses were involved in a variety of health teaching and instructional sessions to groups and in classrooms. Classroom instruction included short presentations on such topics as hygiene, first aid, wellness and fitness promotion, *Open Airways* and other asthma management programs, AIDS peer education, smoking prevention and cessation, violence prevention, puberty, and prenatal and parenting programs. Instruction to faculty and staff included the topics of medication administration, infection control, OSHA blood-borne pathogen regulations, CPR, use of AEDs, first aid, and chronic disease management, including general training on the signs and symptoms and first aid for diabetes, and intensive training for the care of individual students with diabetes. The nurses also conducted health fairs and made presentations to parent organizations, school boards, and civic and community groups. School nurses reported providing a total of 27,825 programs and presentations during the 2009-2010 school year.

- 48 LEAs (42%) present asthma education programs for staff.
- 46 LEAs (40%) provide asthma education programs for students.
- 105 LEAs (91%) provide diabetes education programs for staff

Often, the school nurse is the first health care provider that the student sees. In some cases, the nurse is the only health care provider the student sees for minor illnesses and injuries. During the 2009-2010 school year, school nurses managed nearly 50 percent more individual encounters with students to assess and manage an illness or injury that originated at home, as compared to the previous school year. During the 2009-2010 school year, nurses evaluated at school more than 346,132 student injuries and acute illnesses that had originated outside of school, up from 257,628 in 2008-2009, which in itself was a doubling of that number from the 2007-2008 school year. It is not known whether the student's health insurance status, access to care, family economics or other issues, including transportation, caused this increase. In addition to providing care and guidance, nurses assist families by locating medical and dental resources and referring students to providers for the diagnosis and treatment of a wide variety of health problems.

Health Care Treatments and Procedures at School

Some students with chronic illnesses, physical handicaps and/or disabilities require health care procedures to be performed during the school day. The nurses reported processing orders for at least 27,454 individual medical treatments or procedures.

Number of Specified Health Care Procedures (partial list)

Health Care Procedure	Total
Central Venous Line	38
Diastat (rectal diazepam [Valium®]	1,610
Glucagon Injection	2,395
Nebulizer Treatments	1,971
Shunt Care	184
Tracheostomy Suctioning & Cleaning	107
Tube Feeding	598
Use of Epi-pens	11,239
Bladder Catheterizations	314

The prescriptions for Epi-Pens, the injectible emergency treatment of epinephrine for severe allergies, and Diastat (a medication used to treat prolonged seizures) continue to increase in North Carolina. In the chart above, the number of orders for all other complex health care procedures was essentially unchanged this past school year from the previous year. Epi-pens can be administered by the students themselves but require physician orders and nurse assessment of the student's ability to do so. Medical orders for Epi-Pens rose 15 percent during the 2009-2010 school year, following a 43 percent increase over the prior three years. (Between 2007 and 2010, orders for epinephrine increased 66 percent from 3,847 to 11,239.) Even with state legislation allowing students to self-carry and self-inject epinephrine, only about one-third, or 3,572 during the 2009-2010 school year, actually did assume that responsibility. Self-carry legislation requires that physician and parent both find the student willing and especially able, both cognitively and physically, to know when and how to use the medication and to demonstrate such to school health staff before the emergency arises. Many students do not meet those conditions and in those cases, it has been determined to be safest to involve school staff. Diastat® is administered rectally, requires medical orders and must be administered by a nurse, or if necessary, a staff person trained by a nurse. Medical orders for Diastat increased 18 percent during school year 2009-2010. It is important to note that the number of students for whom either Epi-Pen or Diastat is ordered does not necessarily mean that the medication was given. Both medications are given only when needed for either a severe allergic reaction or prolonged, intractable seizures. Seizures among school-age children who are properly diagnosed and under medical management

Local Outcome

Our first system-wide AED drills were planned and organized by school nurses to include first responders from all schools. The first drill revealed anticipated communication problems. We provided a report to the Superintendent, who advised another drill be conducted. We implemented changes including a phone tree to all schools. The second drill ended with much improved results in response times.

may manifest themselves in school to this degree rarely.

Medications at School

Administration of medications to students by school staff is a serious responsibility, requiring conscientious attention to giving the correct medication in the correct dose to the correct student every time. Secretaries, classroom teachers, and teacher assistants are primarily the school staff members who administer routine medications on a daily basis in the majority of school systems in North Carolina. To ensure that school staff perform this task with safety and accuracy, it is essential that a school nurse be available to review and participate in the development of school policy and procedures; train and supervise teachers and other staff about all aspects of giving medications correctly; and serve as coordinator among parents, medical providers, and the school. In nearly all of the LEAs, school nurses provided formal training programs for school employees who were designated to administer medications. They also conducted periodic audits of medication charts and records to assure compliance with all physician and parent orders and to assess the students' responses to medication therapy.

During the 2009-2010 school year, nurses reported that 29,529 medications were given daily to students while at school, a number essentially unchanged from the previous year. Some students received medication daily on a long-term basis (20,322) for chronic conditions, and others for a shorter duration (9,207), such as to treat an infection or injury. Medications received most frequently on a daily basis included psychotropic controlled substances, including Ritalin®, Dexedrine®, and Lithium®.

An existing order for a medication (or medical treatment or medical procedure) that is used "as needed" rather than regularly and routinely may not result in any given child receiving the medication during the school day or during the school year. For example, an order for an Epi-pen may not be needed all year, but having the medication and physician order (and parent request) to provide medication should a situation arise is a necessary responsibility that school health nurses manage. During the 2009-2010 school year, there was a 69 percent increase, from 49,456 to 83,677, in the number of medications ordered on an "as-needed basis." This increase was almost entirely due to an increase in the number of orders for life-threatening conditions, such as severe allergies, diabetic episodes, and acute asthma episodes.

Medication	Number 2009-2010	Number 2008-2009
Number of students on long term medications (more than 3 weeks)	20,322	20,766
Number of students on emergency medications	51,412	17,265
Number of students on PRN (non-emergency) medications	32,265	32,191
Number of students on short term medications (less than 3 weeks)	9,207	9,268

The number of orders for non-emergency medications ordered PRN, or "as needed," remained essentially unchanged during the 2009-2010 school year, at 32,265 from 32,191. School nurses across the state, as well as physicians and other health care providers who can prescribe medications, carry out the recommendations of the American Academy of Pediatrics to limit school-dosed medications only to those absolutely necessary to maintain the student during the school day. (American Academy of Pediatrics, October 2009, position statement) Because a number of over-the-counter drugs can cause side effects or mask serious illnesses or conditions, state recommendations are to discourage unlimited use of non-prescription medications for school children and require not only parental authorization but also medical provider authorization for any medications given in school during the school day, whether or not a prescription is required for the product. Determining whether the student is describing a situation that requires that "as-needed" medication involves interviewing the student, assessing the situation, and deciding on a course of action.

Without a nurse at every school, school nurses in North Carolina must delegate the administration of medication to other school personnel. The school nurse provides training and oversight to these non-health care professional, also called "Unlicensed Assistive Personnel," (UAP) to handle those student medication situations. Most commonly, those persons are teachers, teaching assistants, coaches or school secretaries. School administrators also commonly administer medications. UAP may continue to need school nurse direction, such as when a medication is ordered with parameters, such as "one or two pain relievers depending on pain level," or two types of allergy medications depending on relief obtained by the primary medication.

The chart below lists three of the most critical drugs administered at school: Diastat and Versed for intractable seizures, and Glucagon for seriously low blood glucose in students with diabetes. The N.C. School Health Unit advises school districts to seek medical orders for a drug other than Versed for school-day administration for a number of reasons, including the low but extremely serious risk of depressing a student's respiratory status. The following chart identifies how many times per year these critical drugs needed to be given in school.

Medication	Administered by RN	Administered by Non-Nurse
Diastat	65	233
Glucagon	4	23
Versed	2	87

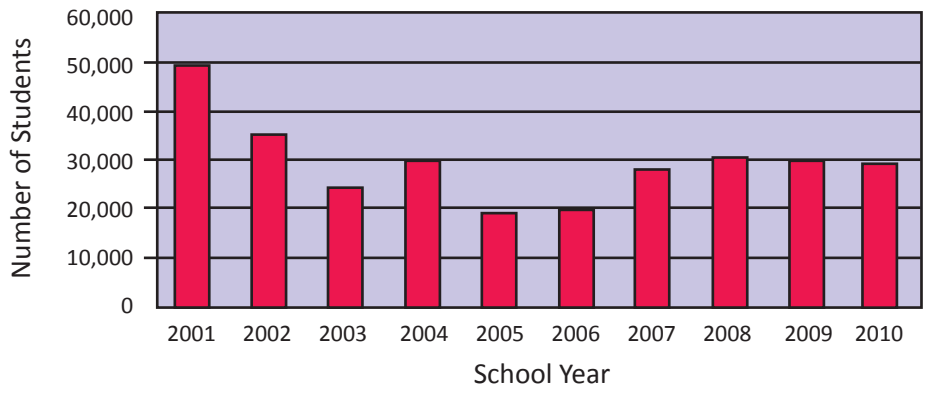
School nurses routinely audit the medication logs of students to assure that students are receiving their medications safely and accurately. Most frequently, these audits occur quarterly during the school year.

The following table and graph provide a 10-year overview of the numbers and percentage of students receiving medications as reported by school nurses. There is a notable decrease in numbers of daily medications during this decade, by nearly 50 percent, and an increase in those given intermittently for episodes or symptoms. This shift can be attributed to a change in dosage from short-acting to longer-acting formulas for a variety of conditions and to a rise in the numbers of medications for episodic conditions such as asthma, seizure, allergy, or chronic conditions that flare up. This change has held steady over the past few years.

Number and Percent of Students Receiving Medications Administered at School

School year	# Students	Daily Medications	Medications for Emergencies
1999-2000	1,237,794	50,554 (4%)	N/A
2000-2001	1,243,442	49,303 (4%)	N/A
2001-2002	1,271,995	35,319 (3%)	N/A
2002-2003	1,279,468	24,477 (2%)	N/A
2003-2004	1,311,163	29,321 (2%)	N/A
2004-2005	1,332,009	19,541 (2%)	N/A
2005-2006	1,363,695	19,772 (1%)	N/A
2006-2007	1,386,363	27,990 (2%)	N/A
2007-2008	1,404,957	30,433 (2%)	39,985 (2.8%)
2008-2009	1,410,497	29,814 (2%)	49,456 (2.1%)
2009-2010	1,402,269	29,529 (2%)	51,412 (3.7%)

Number of Students Receiving Daily Medications at School



School-Located Influenza Clinics

During school year 2009-2010, more than three-quarters of the school districts hosted school-based influenza clinics (87 of 115 LEAs). School nurses and administrators, in cooperation with state and local health departments, hospitals and others, made it possible for more than 200,000 doses to be given to students and/or staff for protection against influenza. At least 109,230 doses of seasonal influenza vaccine and 106,409 doses of H1N1 vaccine were administered at schools either during the school day or after school. Parental permission was required to administer doses to students.

Pregnancy

For the second year in a row, there was a decrease in the reported number of pregnancies among public school students. The number of students reported by school nurses to be known to have been pregnant during

2009-2010 school year is 4,277, 383 fewer than the previous year, and 683 fewer than two years ago. This 8 percent decrease from the previous year, atop a 5 percent decrease the year prior, is an encouraging outcome as it follows several years of increasing pregnancy rates in the schools. The percentage decrease was greatest in elementary grade levels (57%) although the absolute number is relatively low, with a decrease of 7 percent among middle school females and a decrease of 8 percent among high school females. The majority of students (71 %) managed their pregnancies well enough to remain in school during normal school hours; 29 percent of students, at some time during either the prenatal or postpartum period, or both, received home-bound instruction.

Status of School Enrollment for Students Known to be Pregnant

	Elementary	Middle School	High School	Total
Known pregnancies	2007 -2008: 14 2008-2009: 7 2009-2010: 3	2007-2008: 409 2008-2009: 300 2009-2010: 278	2007-2008: 4,481 2008-2009: 4,353 2009-2010: 3,996	2007-2008: 4,904 2008-2009: 4,660 2009-2010: 4,277
Students receiving homebound instruction due to pregnancy 2009-2010	1	63	1,197	1,261

School Year	Pregnancies reported to school staff	% increase or decrease from previous year
1998-1999	2,721	4% decrease
1999-2000	3,316	22%
2000-2001	2,914	12% decrease
2001-2002	2,919	0.1%
2002-2003	2,697	7.6% decrease
2003-2004	3,131	16%
2004-2005	3,406	9%
2005-2006	4,072	20%
2006-2007	4,422	9%
2007-2008	4,904	11%
2008-2009	4,660	5% decrease
2009-2010	4,277	8% decrease

Suicide and Homicide

Intentional death of students, either through suicide or homicide, is a public health concern. Although the number is small by comparison with the adult population, the loss of a student through homicide or suicide is a traumatic event for the entire community.

According to reports from the LEAs, 37 public school students died through homicide or suicide during the 2009-2010 school year. None of those deaths occurred at school. Suicide cases increased from 15 the previous year to 26 in 2009-2010, according to school health reports. Suicide was reported to be attempted by 347 students, a decrease of 18 percent (from 422) from the prior year, although a greater proportion of the attempts resulted in death this school year.

Death by Suicide/Homicide: School year 2009-2010

	Elementary	Middle School	High School	Total
Deaths from suicide	0	4	22	26
Suicides occurring at school	0	0	0	0
Death from homicide	0	2	9	11
Homicides occurring at school	0	0	0	0

Known / Reported Suicide Attempts: School year 2009-2010

	Elementary	Middle School	High School	Total
Attempts by grade level	50	84	213	347

Student Tobacco Use

Since Aug. 1, 2008, all schools must adopt, implement, and enforce tobacco-free[9] school campus policies. In addition to state law and school policy, schools communicate tobacco-free messages to young people through health education programs, social marketing messages, cessation classes for students or staff, and through the day-to-day modeling and interactions among staff and students. In some LEAs, the school nurses offer classes and programs to reinforce restrictions

Local Outcome

We provided intensive nursing interventions and case management to 470 unduplicated students. Seventy-five percent of the students' grades improved, 74 percent improved their attendance, and 90 percent of them increased their compliance with their medical regimens.

[8] School policy totally prohibits tobacco use for all students, staff, and visitors in the school buildings and extends to the entire campus, vehicles, and all school events including outdoor events. The policy extends to hours after regular classroom schedules, 24 hours a day, seven days a week and includes off-campus school sponsored student events.

against smoking and to encourage cessation and provide mentoring to youth groups advocating against tobacco use. The N.C. Health and Wellness Trust Fund reported that in North Carolina in 2009, through the Teen Initiative, more than 2,300 youth participated in 218 youth groups across the state, and that fewer youths took up smoking[10] and more public places became smoke free, especially due to the January 2010 effective date of the N.C. smoke-free law, "An Act to Prevent Smoking in Certain Public Places and Certain Places of Employment" (GS 130A-491) also known as HB2, 2009.

Health Care Coordination and Case Management

The school nurse's role often extends beyond the school setting. Children with chronic or serious acute illnesses and conditions often require frequent daily nursing interventions and coordination of health care across a multitude of providers to enable them to remain in school. School nurses utilize a variety of strategies to communicate with all those involved in the care of a student. Nurses serve as liaisons with physicians, dentists, community agencies and families while supporting and caring for the health needs of students. Among the strategies school nurses enlist to provide health care coordination and case management is making visits to the homes of students. More than 13,431 home visits were conducted during the 2009-2010 school year to assist families with student health issues. This number reflects that nurses maintained the number of home visits they did this year after a 10 percent increase last year.

Case management has been found to be a useful model for coordination of a student's health care. In more than a quarter (28%, or 32) of the school districts, the process has been formalized into a Case Management Program with core components of assessment, health care management, community resources and support, psychosocial intervention, and documentation and evaluation. Through collaboration with a research project at East Carolina University, school nurses are finding additional evidence for comprehensive management of students with chronic health conditions. In addition, case management is part of the North Carolina Child and Family Support Teams Initiative. Regardless of the model used, coordination of care for a student with special health care needs serves to increase a student's ability to manage the condition in school, with a goal of increased educational achievement and improved health outcomes.

Students who receive case management services from a school nurse report positive health outcomes. The tables below show students are improving their skills in self-care, reducing their own exposures to allergens in order to reduce the need for emergency allergy medications, increasing their ability to participate in the entire school day, including physical education, and demonstrating other improvements

Local Outcome

We assisted our school system's Homeless Case Manager in provision of needed health-related services to those students.

[10] University of North Carolina Tobacco Prevention and Evaluation Program (TPEP) 2010

in health and ability to manage their illnesses. Raw numbers, and not percent of students receiving school nurse case management, are tallied in the following table. The results demonstrate the positive outcomes of school nurses who provided case management of students:

School Nurse and Student Management for Allergies

Student Outcome	Number Students
1. Verbalized increased knowledge of pathophysiology of illness	1877
2. Improved skill in delivering own epinephrine	583
3. Reduced episodes of severe allergic reactions requiring use of epi-pen	933
4. Verbalized skill in recognizing hidden sources of allergen	1601

School Nurse and Student Management for Asthma

Student Outcome	Number Students
1. Verbalized increased knowledge of pathophysiology of illness	7711
2. Demonstrated correct use of asthma inhaler and/or spacer	11410
3. Listed 2 or more of his/her asthma triggers	6620
4. Remained within acceptable peak flow/pulse oximeter parameters according to care plan	1142
5. Increased participation in PE and/or after school physical activity	3881

School Nurse and Student Management for Diabetes

Student Outcome	Number Students
1. Verbalized increased knowledge of pathophysiology of illness	739
2. Maintained normal blood sugar 90% or more of times checked	302
3. Improved ability to correctly count carbohydrates	865
4. Improved skill in testing own blood sugar	1050
5. Calculated and correctly drew own dose of insulin 100% of time	501

School Nurse and Student Management for Obesity

Student Outcome	Number Students
1. Verbalized increased knowledge of pathophysiology of illness / condition	575
2. Kept a daily food diary for at least 30 days	100
3. Increased participation in PE, sports or after school physical activity	550
4. Improved ability to correctly count calories, or equivalent (e.g., points, carbs, fats)	234

Local Outcome

We advocated for and succeeded in obtaining AEDs in each school with subsequent training of school staff. As a result of an existing AED unit in a high school, a student's life was saved due to its use and since then, she has made a full recovery!

Emergency Care

Injuries and illnesses are common occurrences in the school-aged population. Because the majority of school nurses cover more than one school building, few schools have a school nurse on duty during the entire school day. Therefore, school nurses must assure that school personnel are trained to provide first aid in emergencies. Sixty-seven percent (77 of 115) of the N.C. LEAs reported having staff identified as first responders available daily in each school building.

Currently, 108 LEAs reported having at least one AED (Automated External Defibrillator) on one or more school campuses. During 2009-2010, the AEDs were used on students six times and on staff four times; four visitors also required use of an AED. Eleven of those 14 victims of sudden cardiac arrhythmias survived, two did not. The condition of one person was not reported.

Many minor incidents occur to students and staff during the course of the school day and are often handled by teaching and office staff. School nurses are frequently required to assist with major injuries, of which there were more than 23,783 this past year, a slight increase of about 3,000. Serious injuries are defined as medical emergencies requiring an Emergency Medical Service (EMS) call or immediate medical care plus the loss of one-half day or more of school.

Of the serious injuries reported, most occurred on the playground or school sports fields (27%) and in physical education (21%), and another 19 percent occurred in the classroom. For a complete breakdown of type and place of injury, refer to Appendix B on page 35.

No students died from their school-related injuries this past school year, following a year in which two students died from football-related injuries. Eight students, though, were permanently disabled by their injuries, and those permanent disabilities included: loss of vision, chronic dislocation of one or more joints, and loss of tip of finger. More than one thousand of the injuries required the involvement of law enforcement: 1,005 of the injuries resulted from an incident in which police (or resource officers) were called to respond or investigate.

Health Screening, Referral, Follow-up, and Securing Care

Voluntary mass screenings by grade or school are often conducted with the assistance of trained volunteers or other health professionals.

Vision screenings are conducted by school nurses as well as by other school staff and volunteers. School nurses follow up on those referred for vision examination and in many cases are the persons who locate sources of free care for those unable to afford treatment.

Significant numbers of students who were referred to a dentist or doctor based on the screening process did not or were not able to secure that care from a health professional. Additional staff to provide appropriate follow-up and care management services

Local Outcome

Our [School Health Advisory Council] continues to strive for ways to fight the obesity problem of our children. We have formed a subcommitte to focus on continued improvement and elimination of any obstacles that may be preventing students from getting their healthy meals at school. Some strategies we have used: promoting healthier options for parties at school, soda machines turned off even to all students, and a Biggest Mover program at the schools.

for students may reduce this gap in the completion of the screening process. In some situations, securing additional health care providers may also reduce the gap.

North Carolina's children and youth are among the most overweight in the nation, with the state ranking 11th nationally for childhood obesity.[11] In North Carolina, nearly one-third of children aged 10 – 17 are overweight or obese. The N.C. General Assembly responded to what is called an epidemic of obesity in 2009 by creating the Legislative Task Force on Childhood Obesity. This task force conducted all-day meetings on topics related to obesity, including access to nutrition and encouraging physical activity. Eighteen school districts have instituted programs to screen students for overweight/obesity by measuring height and weight and obtaining the Body-Mass Index (BMI). Some of these programs were coupled with assessments of the level of physical activity or physical fitness of the students. Some school districts measure growth in height and weight but do not convert those figures to a BMI. These screenings are conducted in a variety of settings: health fairs, physical education classes, or routine collecting of height and weight data. In some cases, the screenings are conducted in collaboration with other health partners. Data from 2009-2010 do not distinguish between referral for overweight or underweight. Some students with results indicating lower than expected growth in either height or weight may have been referred for medical evaluation.

The percentage of public school students screened for BMI in North Carolina by the school health services is small, 6 percent of the total school population, but even that was double the number of students screened in N.C. public schools for BMI the previous year, from 30,991 the year before to 79,084 this past school year. About 7 percent of those students who were measured received referrals for either overweight or underweight. The referral rate of 7 percent is much lower than the expected 33 percent, but the sample of students screened is not representative of the entire student population. One significant finding from the previous year is that more students who are referred are actually receiving an evaluation from a qualified medical provider. Thirty percent of those students identified as needing follow up secured care, a significant improvement over the estimated 2 percent who secured care the previous school year.

Because the presence of childhood overweight significantly increases a child's risk for adult obesity, the public health, health care and school health communities have joined forces to develop and provide interventions. According to the North Carolina Alliance for Athletics, Health, Physical Education, Recreation and Dance (NCAAPHERD), 80 percent of the state's school districts (93) implemented ISPOD (In-School Prevention of Obesity and Disease) in the first two

[11] N.C. Legislative Task Force on Childhood Obesity, Dec. 13, 2010

years of the four-year project. ISPOD is a comprehensive program designed to improve physical activity and eating habits in order to reduce obesity and incidence of overweight among children in grades kindergarten through eight. By the end of school year 2009-2010, ISPOD staff with NCAAPHERD had trained nearly 2,400 teachers (physical education, health and other classroom teachers) who reach approximately 750,000 students in the state. In many of those schools, the school nurses promoted and facilitated the activities of the program.

The following table lists the results of some of the mass screening projects that were conducted during the 2009-2010 school year.

Number of Students Screened by School Health Services Staff

Screening	Screened	Referred	% Referred	Secured Care	% Secured Care
BMI	79,084	5,586	7%	1691	30%
Hearing	156,808	4,027	3%	2,748	68%
Vision	527,843	38,216	7%	27482	72%

Screening for vision is the most frequent school screening program in North Carolina. More than half a million North Carolina school children – 38 percent – had their vision checked for possible eye problems. The school vision screening program is an example of the highly collaborative intersections among school health professionals, non-profit organizations, volunteers and health care providers. The Prevent Blindness North Carolina Vision Screening Certification Program works under contract with the N.C. Division of Public Health in collaboration with the Children and Youth Branch to deliver vision screening certification training to all 100 counties. The PBNC's certification program is the Division of Public Health's primary means of assuring consistent screening practices and referral criteria across all schools in North Carolina.

The goal of any mass screening program is to assess the condition, and treat if indicated. One indicator of the success of a school health screening program is the percent who secured care – how many of the students who did not pass a screening and therefore were referred for further evaluation, actually completed the process by seeing a health care provider for the condition? Among the health conditions for which school nurses screened during the 2009-2010 school year, screening for vision achieved a 72 percent successful completion rate. Some school districts, by increasing numbers of school nurses, and by increasing efforts to communicate with parents and finding health care resources for school children, achieved 100 percent secured care rates.

Health Policies

Local Outcome

We fully integrated electronic medical record-keeping into our school health program. Using EMR and a school nurse case management model, we were able to complete individual health plans for all students who needed them.

Policies are essential to guide the development and implementation of coordinated school health programs. All local health departments in the state develop an agreement, the Memorandum of Agreement (MOA), with each school district in their jurisdiction. These MOAs are locally developed and provide an avenue for collaboration on school and health policies and procedures.

School policies guide school nursing practice, provide parents a consistent method of communicating those policies, and provide students and staff assurance of health and safety. The N.C. School Health Unit of the Division of Public Health provides guidelines regarding policy development at the local level, and recommends, at minimum, that school boards study and develop written policies on the topics listed on the chart below.

The percentage column indicates the percent of LEAs that have written policies on those topics. A greater percentage of LEAs adopted policies on maintenance of student health records (from 69% to 77%) and on reporting student injuries (from 63% to 74%).

Health Policy	% of LEAs with written, board-approved policy
Prevention and control of communicable disease	99%
Medication administration	98%
Special health care services (State Board Policy GCS-G-006-.0402)	85%
Provision of emergency care	83%
Maintenance of student health records	77%
Reporting student injuries	74%
Identification of students with acute or chronic health care needs/conditions	66%
Screening, referral and follow-up	59%
Non-school bus transportation for students with health care needs	41%
Response to Do Not Resuscitate (DNR) order	27%

Community Involvement in School Health Services

Community involvement contributes to the quality and effectiveness of school health programs and services. School nurses encourage and promote community involvement through:

- establishment of school health advisory councils,
- development of inter-agency planning and written agreements,
- recruitment of local physician advisors, and
- development of parent-teacher (PTA/PTO) health subcommittees.

Three of the more visible activities reflecting school and community involvement include:

SHAC (School Health Advisory Council)

Memorandum of Agreement between health departments and school districts

School-Based School-Linked Health Centers (SBSLHC)

School Health Advisory Council (SHAC)

All of the local education agencies reported having School Health Advisory Councils (SHACS). These multi-disciplinary councils are required by State Board of Education policy #GCS-S-000. Nearly all of the SHACs have a school nurse among the council members (111 of 115) and 53 SHACs have a physician serving on the council.

MOA Between Health Department and School District

In every county in the state, a Memorandum of Agreement between the local health department and the school district is a required component of the receipt of state funds for Child Health selected activities to the local health departments or health districts. These annually negotiated relationships outline the specific activities each agency will undertake to support the health of children in public schools. They delineate the responsibilities of each regarding epidemics and other community emergencies and the specific consultations that each will provide the other, while respecting student privacy. In addition to consultation with health department experts, nearly two-thirds (60%) of the LEAs are able to consult with a physician regarding the school health program. Most (57 of the physicians, or 83%) who serve in that capacity are trained as either family practice physicians or pediatricians.

School-based, School-linked Health Centers

In about one fifth of the state's counties, coalitions of local health care providers have established school health centers in the schools using grants, local funding and some state funding assistance. During school year 2009-2010, there were 62 school-based, school-linked health centers operating in 22 counties.[12] The clinics primarily serve students in middle and high schools due to the significant need of adolescents for access to medical care. Centers provide primary care and preventive clinical services during the school day, minimizing interruption of the student's time in class. These sites increase the school nurse's ability to refer a student or his family for medical care, especially in areas of low resources.

[12] www.ncscha.org/about.php

The school-based or school-linked centers provide clinical health services and may bill for the services to the parent's insurance, other insurance providers and Medicaid. Parental permission is required for school health center services, including required and recommended (but optional) immunizations, physical exams for sports, diagnosis and treatment for medical conditions, behavioral or mental health counseling, and nutrition counseling.

Nurses employed by school-based health centers function similarly to those in a physician's office or clinic. Since they do not meet the definition of nor provide the population-based functions of school nurses, those registered nurses working in the schools are not counted among the state's school nurse positions nor in the school nurse ratio.

School Health Centers depend on a combination of state funds, patient revenues, private foundation funds/donations and in-kind resources to support the health services that they provide. Twenty-six centers are partially funded by the N.C. Division of Public Health. These funds are used to leverage additional resources at the local level. Partners in these centers include N.C. Department of Public Instruction, N.C. Division of Medical Assistance, families, private medical practices, local health departments, universities and the N.C. School and Community Health Alliance (NCSCHA).

Information below represents reports submitted by the 26 centers that receive partial funding from N.C. Public Health. Additional information on school based health centers may be obtained from the NCSCHA website, **www.ncscha.org**.

During the 2009-2010 school year:

- 19,821 students had parent/guardian permission to utilize all services of the school based health center.
- Among those students, there were 89,045 student visits, an average of 4.5 visits per student during the year.
- Students were seen by a variety of health care providers, including medical doctors; registered dieticians; behavioral and mental health professionals; certified nurse practitioners or physician assistants

Conclusion

School health services are just one component of a Coordinated School Health Program. By working with multiple partners in health and education, including the North Carolina Division of Public Health, North Carolina Division of Medical Assistance, North Carolina Department of Public Instruction, North Carolina Pediatric Society, North Carolina Dental Society, Prevent Blindness North Carolina, North Carolina School and Community Health Alliance, and more, school nurses are working to help students achieve at levels they might not otherwise reach. An increase in the number of school nurses in North Carolina could positively impact overall student health and well-being, resulting in improved student attendance and academic outcomes.

Appendix A: Chronic Health Conditions, School Year 2009-10

Condition	Elementary	Middle	High	Total	Total students with IHP for condition
ADD/ADHD	30301	14918	11409	56628	2068
Addison's Disease	17	8	8	33	16
Allergies (Severe)	13446	4142	4771	22359	13894
Anorexia/Bulimia	21	90	195	306	36
Asthma	51096	22177	19565	92838	40899
Autistic Disorders (ASD) including Asperger's Syndrome, PDD	4369	1622	1491	7482	555
Blood Disorders including Chronic Anemia, Thalassemia	284	178	216	678	247
Cancer, including Leukemia	364	149	259	772	216
Cardiac Condition	2297	1097	1458	4852	1384
Cerebral Palsy	1247	464	592	2303	610
Chromosomal Conditions: including Down's Syndrome, Fragile X, Trisomy 18	1114	395	557	2066	335
Chronic Encopresis	387	70	51	508	181
Chronic infectious diseases: including Toxoplasmosis, Cytomegalovirus, Hepatitis B, Hepatitis C, HIV, Syphilis, Tuberculosis	72	45	82	199	22
Cystic Fibrosis	154	77	85	316	141
Diabetes Type I	984	851	1331	3166	2849
Diabetes Type II	193	352	586	1131	598
Emotional/Behavior and/or Psychiatric Disorder other than ADD/HD	4313	3059	3522	10894	1148
Fetal Alcohol Syndrome	63	31	22	116	8
Gastrointestinal Disorders (Crohn's, etc.)	2445	1037	1318	4800	950
Hearing Loss	2059	868	867	3794	290
Hemophilia/Bleeding Disorder	326	175	204	705	286
Hydrocephalus	294	85	131	510	265
Hypertension	277	317	697	1291	218
Hypo/Hyperthyroidism	200	160	268	628	71
Metabolic Conditions: Hypo/Hyperthyroidism, Others	259	276	230	765	198
Migraine Headaches	2952	3041	4148	10141	1461

Condition	Elementary	Middle	High	Total	Total students with IHP for condition
Multiple Sclerosis	16	21	27	64	19
Muscular Dystrophy	105	50	67	222	107
Obesity (> 95th% BMI)	7452	2856	2267	12575	1633
Orthopedic Disability (Permanent)	1075	586	820	2481	411
Other Neuromuscular or Neurological Condition	715	329	442	1486	395
Renal Condition	1041	541	586	2168	490
Rheumatological Conditions	231	174	260	665	175
Seizure Disorder/Epilepsy	4498	1846	2166	8510	5022
Sickle Cell Anemia	532	218	279	1029	581
Sickle Cell Trait	384	140	159	683	48
Spina Bifida	232	103	137	472	226
Substance Abuse	2	213	1157	1372	163
Traumatic Brain Injury	204	120	176	500	135
Visually Impaired	1875	797	1035	3707	264
Total	137896	63678	63641	265215	78615

Appendix B: Reported Injuries in North Carolina Public Schools Requiring EMS Response or Immediate Care by Physician/ Dentist AND Loss of 1/2 Day or More of School, School Year 2009-10

Type of Injury	Bus	Hallway	Classroom	Playground	PE Class	Shop	Restroom	Lunchroom	Other	Total #	Total %
Abdominal/internal injuries	5	15	79	78	48	0	3	4	20	252	**1%**
Anaphylaxis	0	6	120	43	11	0	1	42	22	245	**1%**
Back Injuries	10	25	49	131	125	0	3	3	37	383	**2%**
Dental Injury	20	40	153	333	188	5	11	16	38	804	**4%**
Drug Overdose	13	10	80	3	5	0	13	15	50	189	**1%**
Eye Injuries	12	65	280	290	192	26	8	21	26	920	**4%**
Fracture	10	129	141	1,208	719	9	15	12	203	2,446	**11%**
Head Injuries	41	170	247	905	454	13	61	42	125	2,058	**9%**
Heat Related Emergency	2	2	32	89	87	2	1	4	34	253	**1%**
Laceration	46	176	539	848	450	117	70	50	184	2,480	**11%**
Neck Injuries	5	5	10	59	44	2	3	1	12	141	**1%**
Psychiatric Emergency	6	45	380	22	9	0	10	10	104	586	**3%**
Respiratory Emergency	53	56	744	291	283	0	7	19	70	1,523	**7%**
Seizure	40	92	728	47	48	4	14	34	53	1,060	**5%**
Sprain or Strain	47	272	310	1,493	1,867	27	26	35	272	4,349	**19%**
Other	35	133	380	277	299	15	30	38	3,887	5,094	**22%**
Total #	345	1,241	4,272	6,117	4,829	220	276	346	5,137	22,783	**100%**
Total %	**2%**	**5%**	**19%**	**27%**	**21%**	**1%**	**1%**	**2%**	**23%**	**100%**	

Appendix C: North Carolina School Nurse-to-Student Ratio by Local Education Agency, School Year 2009-10

County/LEA Name	Ratio (Nurse:Student)	County/LEA Name	Ratio (Nurse:Student)
Alamance-Burlington	908	Forsyth	1,782
Alexander	993	Franklin County	1,076
Alleghany +	742	Gaston	1,476
Anson +	424	Gates +	620
Ashe	1,059	Graham +	494
Avery	1,095	Granville County	1,727
Beaufort	1,403	Greene +	458
Bertie +	704	Guilford	2,233
Bladen	923	Halifax County +	493
Brunswick	1,174	Roanoke Rapids City +	712
Buncombe	1,445	Weldon City +	508
Asheville City	1,055	Harnett	1,822
Burke	1,225	Haywood	941
Cabarrus	956	Henderson	1,456
Kannapolis City +	676	Hertford +	616
Caldwell	1,153	Hoke	850
Camden +	630	Hyde +	287
Carteret	1,178	Iredell-Statesville	1,403
Caswell	758	Mooresville City	1,084
Catawba	1,142	Jackson	965
Hickory City	873	Johnston	2,124
Newton Conover +	712	Jones +	579
Chatham County	1,317	Lee County	1,154
Cherokee +	566	Lenoir	1,303
Chowan +	578	Lincoln	1,476
Clay +	670	Macon	856
Cleveland	1,148	Madison	1,291
Columbus	935	Martin +	644
Whiteville City Schools +	570	McDowell +	739
Craven +	695	Mecklenburg	1,133
Cumberland	2,047	Mitchell	1,045
Currituck +	608	Montgomery County	844
Dare +	477	Moore County	1,748
Davidson	3,141	Nash County	879
Lexington City Schools +	614	New Hanover +	746
Thomasville City Schools	816	Northampton County +	655
Davie	999	Onslow	1,119
Duplin +	653	Orange County +	620
Durham County	1,141	Chapel Hill/Carrboro +	642
Edgecombe County	1,030	Pamlico +	272

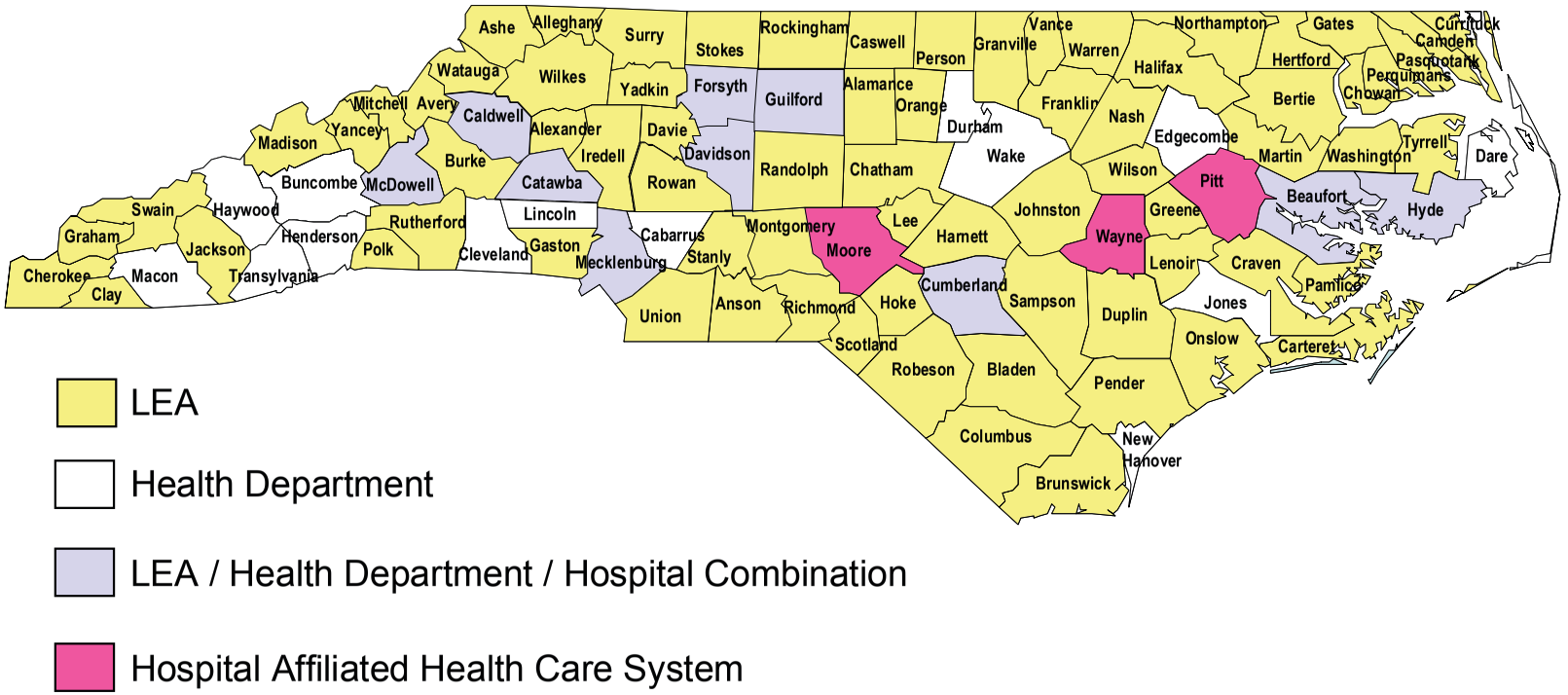
Appendix C: North Carolina School Nurse-to-Student Ratio by Local Education Agency, School Year 2009-10

County/LEA Name	Ratio (Nurse:Student)	County/LEA Name	Ratio (Nurse:Student)
Pasquotank	987	Surry County	1,059
Pender	836	Elkin City Schools	754
Perquimans	863	Mt. Airy City Schools +	532
Person County	837	Swain +	329
Pitt	1,414	Transylvania	1,198
Polk	1,182	Tyrrell +	569
Randolph County	2,056	Union	1,167
Asheboro City	897	Vance County +	646
Richmond +	634	Wake County	2,383
Robeson	1,004	Warren County +	623
Rockingham County	1,725	Washington +	618
Rowan-Salisbury	1,686	Watauga	1,073
Rutherford	1,503	Wayne	1,106
Sampson	1,084	Wilkes County	1,041
Clinton City +	599	Wilson County	2,041
Scotland +	484	Yadkin County	973
Stanly	1,522	Yancey +	590
Stokes County	1,383	**North Carolina**	1,185

+ LEAs at or below 1:750 school nurse to student ratio

Note: Ratio reflected in this chart may not match locally produced ratio due to differences in formula for calculating ratio and due to position allocations in June 2010 that are included in the 2009-10 report but may not be included in locally produced reports.

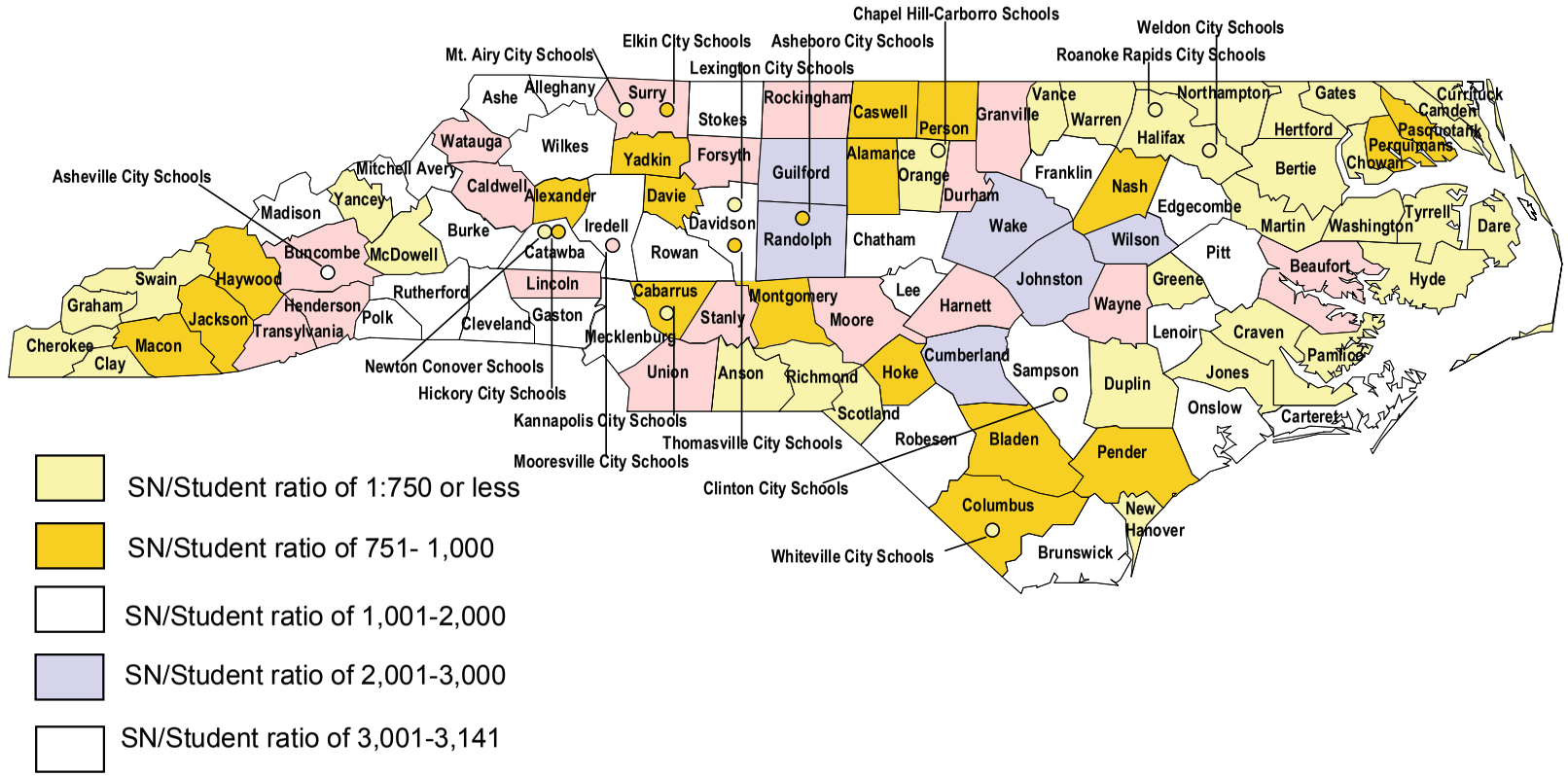
Administrative Responsibility for School Nursing Services
July 2010



Source: NC Annual Survey of School Health Services NC DHHS August 2010

Appendix D

School Nurse/Student Ratio SY 2009 - 2010



Note: The standard school nurse to student ratio of 1:750 has been adopted by the N.C. Public Health Task Force, the N.C. Department of Public Instruction and the N.C. Division of Public Health and is based on recommendations made by the American Academy of Pediatrics, the Centers for Disease Control and Prevention, and the National Association of School Nurses.

Source: NC Annual Survey of School Health Services NC DHHS August 2010

Appendix E

State of North Carolina | Beverly Eaves Perdue, Governor
Department of Health and Human Services | Lanier M. Cansler, Secretary
Division of Public Health | Jeffrey P. Engel, M.D., State Health Director
Women's and Children's Health Section
Children and Youth Branch | School Health Unit
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